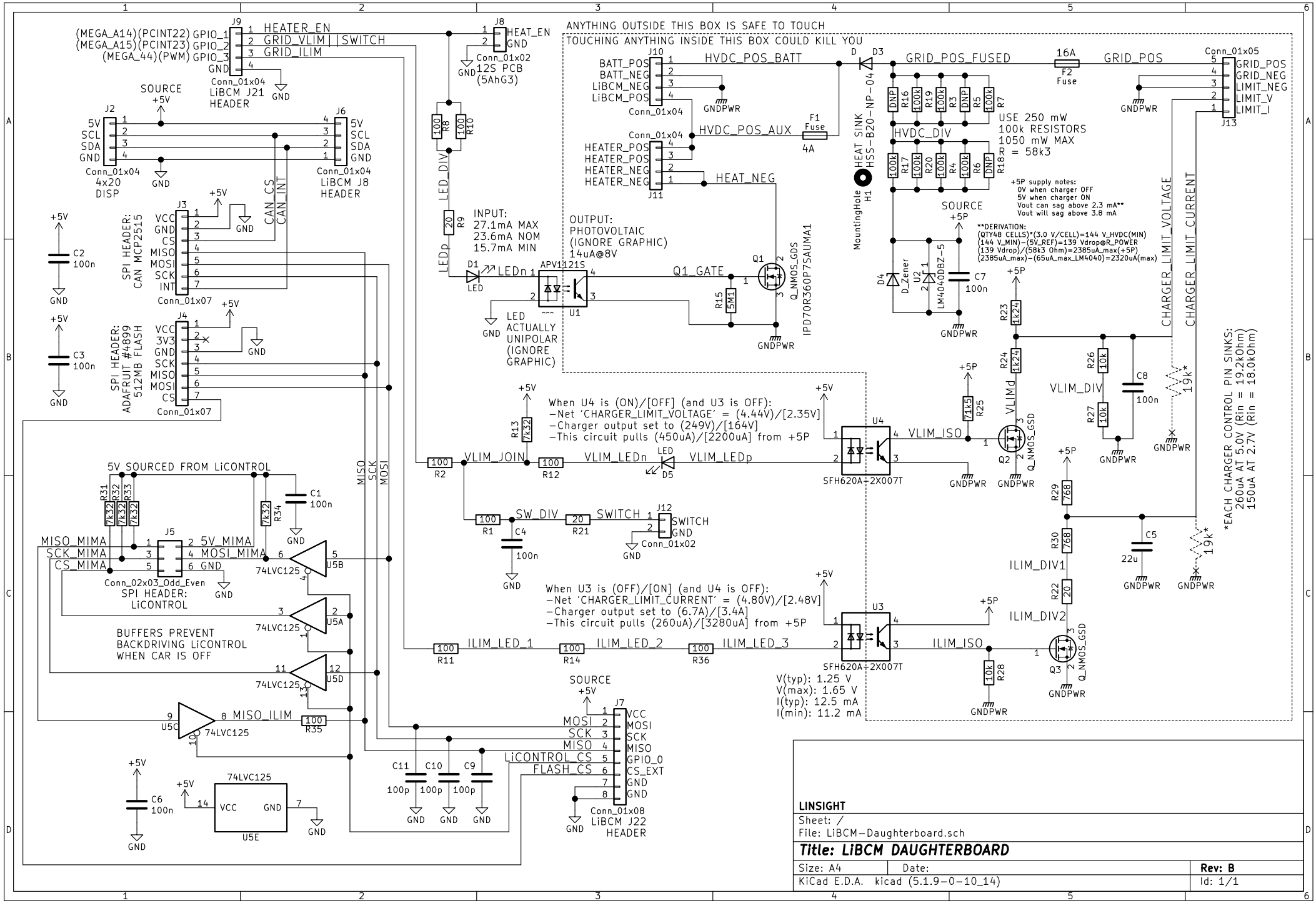
ANYTHING OUTSIDE THIS BOX IS SAFE TO TOUCH
TOUCHING ANYTHING INSIDE THIS BOX COULD KILL YOU
J9 Conn_01x04 LiBCM J21 HEADER
(MEGA_A14)(PCINT22) GPIO_1 HEATER_EN
(MEGA_A15)(PCINT23) GPIO_2 GRID_VLIM||SWITCH
(MEGA_44)(PWM) GPIO_3 GRID_ILIM
J8 Conn_01x02 12S PCB (5AhG3)
HEAT_EN
J10 Conn_01x04
BATT_POS HVDC_POS_BATT
BATT_NEG
LiBCM_NEG
LiBCM_POS
J11 Conn_01x04
HEATER_POS HVDC_POS_AUX
HEATER_POS
HEATER_NEG
HEATER_NEG HEAT_NEG
F1 Fuse 4A
D3 HEAT SINK HSS-B20-NP-04
MountingHole H1
GRID_POS_FUSED
F2 Fuse 16A
GRID_POS
J13 Conn_01x05
GRID_POS
GRID_NEG
LIMIT_NEG
LIMIT_V
LIMIT_I
USE 250 mW 100k RESISTORS 1050 mW MAX R = 58k3
HVDC_DIV
R16 100k R19 100k R3 DNP R5 100k R7
R17 100k R20 100k R4 100k R6 DNP R18
+5P supply notes:
0V when charger OFF
5V when charger ON
Vout can sag above 2.3 mA**
Vout will sag above 3.8 mA
**DERIVATION:
(QTY48 CELLS)*(3.0 V/CELL)=144 V_HVDC(MIN)
(144 V_MIN)-(5V_REF)=139 Vdrop@R_POWER
(139 Vdrop)/(58k3 Ohm)=2385uA_max(+5P)
(2385uA_max)-(65uA_max_LM4040)=2320uA(max)
SOURCE +5P
D4 D_Zener
U2 LM4040DBZ-5
C7 100n
R23 1k24
R24 1k24
R26 10k
R27 10k
C8 100n
VLIMd
VLIM_DIV
CHARGER_LIMIT_VOLTAGE
CHARGER_LIMIT_CURRENT
19k*
*EACH CHARGER CONTROL PIN SINKS:
260uA AT 5.0V (Rin = 19.2kOhm)
150uA AT 2.7V (Rin = 18.0kOhm)
J2 Conn_01x04 4x20 DISP
5V SCL SDA GND
J6 Conn_01x04 LiBCM J8 HEADER
CAN_CS CAN_INT
J3 Conn_01x07 SPI HEADER: CAN MCP2515
VCC GND CS MISO MOSI SCK INT
C2 100n
J4 Conn_01x07 SPI HEADER: ADAFRUIT #4899 512MB FLASH
VCC 3V3 GND SCK MISO MOSI CS
C3 100n
R8 100 R10 100
LED_DIV
R9 20
LEDp
D1 LED
LEDn
APV1121S U1
INPUT: 27.1mA MAX 23.6mA NOM 15.7mA MIN
OUTPUT: PHOTOVOLTAIC (IGNORE GRAPHIC) 14uA@8V
LED ACTUALLY UNIPOLAR (IGNORE GRAPHIC)
Q1_GATE
R15 5M1
Q1 Q_NMOS_GDS IPD70R360P7SAUMA1
When U4 is (ON)/[OFF] (and U3 is OFF):
-Net 'CHARGER_LIMIT_VOLTAGE' = (4.44V)/[2.35V]
-Charger output set to (249V)/[164V]
-This circuit pulls (450uA)/[2200uA] from +5P
R13 7k32
VLIM_JOIN
R2 100
R12 100
VLIM_LEDn
D5 LED
VLIM_LEDp
U4 SFH620A-2X007T
VLIM_ISO
R25 71k5
Q2 Q_NMOS_GSD
R29 768
R30 768
C5 22u
ILIM_DIV1
R22 20
ILIM_DIV2
R1 100
SW_DIV
C4 100n
R21 20
SWITCH
J12 Conn_01x02
5V SOURCED FROM LiCONTROL
R31 7k32 R32 7k32 R33 7k32
R34 7k32
C1 100n
MISO SCK MOSI
J5 Conn_02x03_Odd_Even SPI HEADER: LiCONTROL
MISO_MIMA
SCK_MIMA
CS_MIMA
5V_MIMA
MOSI_MIMA
GND
U5B 74LVC125
U5A 74LVC125
U5D 74LVC125
BUFFERS PREVENT BACKDRIVING LiCONTROL WHEN CAR IS OFF
When U3 is (OFF)/[ON] (and U4 is OFF):
-Net 'CHARGER_LIMIT_CURRENT' = (4.80V)/[2.48V]
-Charger output set to (6.7A)/[3.4A]
-This circuit pulls (260uA)/[3280uA] from +5P
R11 100
ILIM_LED_1
R14 100
ILIM_LED_2
R36 100
ILIM_LED_3
U3 SFH620A-2X007T
ILIM_ISO
R28 10k
Q3 Q_NMOS_GSD
V(typ): 1.25 V
V(max): 1.65 V
I(typ): 12.5 mA
I(min): 11.2 mA
U5C 74LVC125
MISO_ILIM
R35 100
C6 100n
U5E 74LVC125
C11 100p C10 100p C9 100p
J7 Conn_01x08 LiBCM J22 HEADER
MOSI
SCK
MISO
LiCONTROL_CS
FLASH_CS
VCC MOSI SCK MISO GPIO_0 CS_EXT GND GND
LINSIGHT
Sheet: /
File: LiBCM-Daughterboard.sch
Title: LiBCM DAUGHTERBOARD
Size: A4
Date:
Rev: B
KiCad E.D.A. kicad (5.1.9-0-10_14)
Id: 1/1